An annotated, systematic and distributional list of the Zygaenidae of Hungary

(Lepidoptera)

Imre FAZEKAS

Abstract

A checklist of the Zygaenidae of Hungary is provided together with the distribution of each species in the different ecological regions of Hungary. The conservation status of each species is indicated.

Introduction

During the past 20 years I have examined in detail the taxonomy and geographical distribution of the Zygaenidae of Hungary (FAZEKAS 1977; 1980a,b; 1981a,b; 1982a,b; 1983a,b,c; 1984a,b; 1986; 1995). I have revised the material in the Museums of Hungary and also that in some of the significant private collections. According to the present state of my research, 25 Zygaenidae taxa are present in Hungary. There have been substantial changes in the nomenclature and taxonomic status of species and subspecies.

In the present study I provide a checklist of valid names synonyms of the Hungarian species. I have recorded the geographical distribution of the taxa according to the six Hungarian macroregions. The geographical distribution of the taxa is exceedingly different in certain regions. I have designed a 12-grade scala for the characterization of the distributions data.

Systematic list of the Hungarian Zygaenidae

ZYGAENINAE

Genus *Zygaena* FABRICIUS, 1775

1. *Z. punctum punctum* OCHSENHEIMER, 1808
   = *eversmanni* HEYDENREICH, 1851
   = *isaszeghensis* REISS, 1929
2. *Z. cynarae cynarae* (ESPER, 1789)
   = *genistae* HERRICH-SCHÄFFER, 1846
   = *pusztae* BURGEFF, 1926
3. *Z. laeta laeta* (HÜBNER, 1790)
4. *Z. brizae brizae* (ESPER, 1800)
5. *Z. minos minos* ([DENIS & SCHIFFERMÜLLER], 1775)
   = *vindobonensis* REISS, 1940
6. *Z. purpuralis purpuralis* (BÜNNICH, 1763)
   = *pythia* FABRICIUS, [1777]
   = *scabiosae* (SCHEVEN, 1777)
   = *pilosellae* (ESPER, 1780)
   = *pythia* (HÜBNER, [1806])

= *pluto* OCHSENHEIMER, 1808
= *pasiphae* MEIGEN, [1829]
= *heringi* ZELLER, 1844

7. *Z. fausta agilis* REISS, 1932

8. *Z. carniolica flaveola* (ESPER, 1786)

9. *Z. loti loti* ([DENIS & SCHIFFERMÜLLER], 1775)
= *fulvia* FABRICIUS, [1777]
= *amsteinii* (SCHEVEN, 1782)
= *bellis* (BORKHAUSEN, 1789)
= *serpylli* (BORKHAUSEN, 1789)
= *bellidis* (HÜBNER, 1806)
= *lunata* HEYDENREICH, 1851
= *peszerensis* REISS, 1929
= *vindobonica* Reiss, 1958

10. *Z. osterodensis curvata* BURGEFF, 1926
= *matrana* BURGEFF, 1926
= *budensis* HOLIK, 1942

11. *Z. viciae viciae* ([DENIS & SCHIFFERMÜLLER], 1775)
= *meliloti* (ESPER, 1789)
= *buglossi* BOISDUVAL, 1829
= *heydenreichii* HEYDENREICH, 1851

12. *Z. ephialtes pannonica* HOLIK, 1937

13. *Z. angelicae angelicae* OCHSENMEIER, 1808

14. *Z. filipendulae polygalae* (ESPER, 1783)

15. *Z. lonicerae lonicerae* (SCHEVEN, 1777)
= *graminis* (VILLERS, 1789)
= *aspesia* MEIGEN, [1829]
= *ussurensis* REISS, 1929

PROCRIDINAE

Genus *Theresimima* STRAND, 1917

16. *T. ampellophaga* (BAYLE-BARELLE, 1808)
= *vitis* (FREYER, 1829)
= *forma astrapta* DANNEHL, 1933

Genus *Rhagades* WALLENGREN, 1863

17. *R. pruni* ([DENIS & SCHIFFERMÜLLER], 1775)

Genus *Jordanita* VERITY, 1946

18. *J. budensis budensis* (SPEYER & SPEYER, 1858)
= *cuprea* (RAMBUR, 1866)

19. *J. notata* (ZELLER, 1847)
= *soror* (RAMBUR, 1866)
= *superior* (ROCCI, 1937)

20. *J. subsolana* (STAUDINGER, 1862)
= *cognata* (RAMBUR, 1866)

= *modesta* (VERITY, 1946)
= *venusta* (VERITY, 1946)
= *schuetzei* (ALBERTI, 1940)

21. *J. graeca graeca* (JORDAN, 1907)

22. *J. chloros chloros* (HÜBNER, [1813])
= *sepium* (BOISDUVAL, 1834)

23. *J. globulariae* (HÜBNER, 1793)
= *cognata* (sensu JORDAN, 1907) nec (HERRICH-SCHÄFFER, 1847)
= *acanthophora* (AGENJO, 1938)
= *bosniaca* (ALBERTI, 1937)
= *stricta* VERITY, 1946
= *aureoviridis* (VERITY, 1946)
= *caerulae* (VERITY, 1946)
= *urbis* (VERITY, 1946)

Genus *Adscita* RETZIUS, 1783

24. *A. geryon geryon* (HÜBNER, [1813])
= ? *minor* (EVERSMANN sensu JORDAN, 1907)
= *aeris* VERITY, 1946

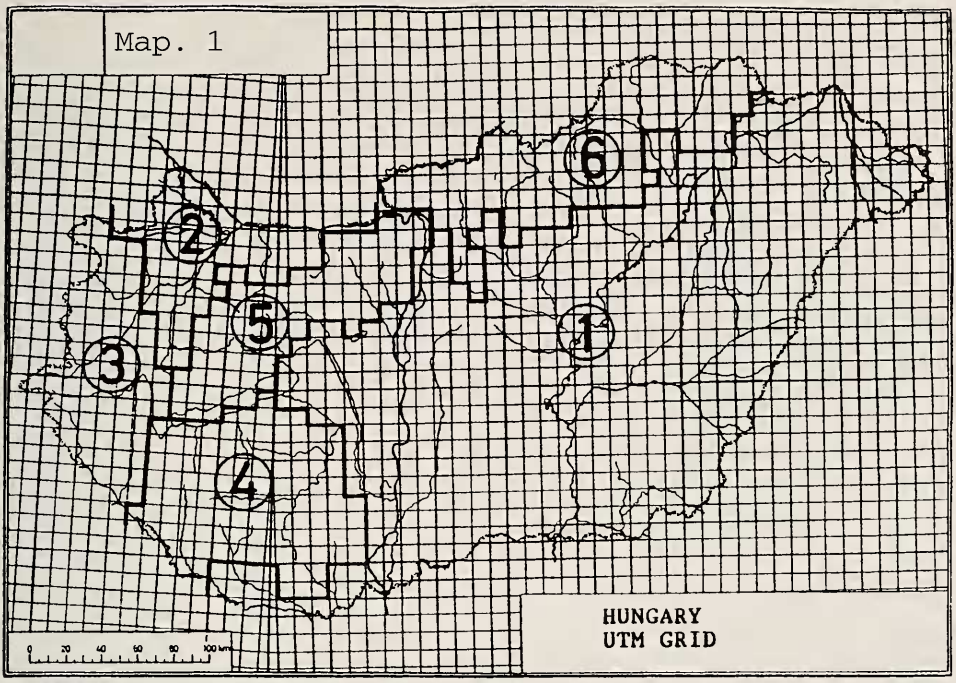
25. *A. statices statices* (Linnaeus, 1758)
= *stuticus* (GEOFFROY in FOURCROY, 1785)
= *micans* (FREYER, 1833)
= *uralensis* (GRUM-GRSHIMAILO, 1893)
= *extensa* (ALBERTI, 1937)
= *anomala* VERITY, 1946
= *lutrinensis* (HEUSER, 1960)
= *heuseri* (REICHL, 1964)
= *talis* (HEUSER, 1964)
= *palatis* (HEUSER, 1964)
= *albis* (HEUSER, 1964)

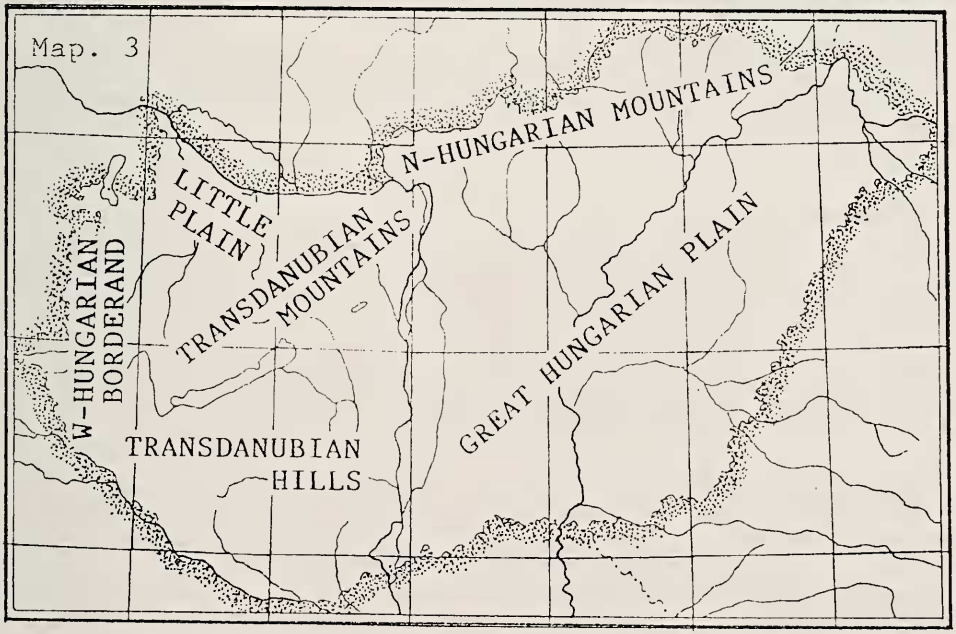
A Brief Account of the Hungarian Landscape Types
(Map. 1-3)

1. Great Hungarian Plain
Flat plains, 75-200 m. Plain with moderately continental climata, landscape types predominantly used for agriculture. Natural vegetation: Oak forests and grassland on sand, loess puszta, alkaline vegetation on solonchalk, alluvial forests and swamps.

2. Little Plain
Flat plains, 75-200 m. Alluvial plain; cultivated grassland with high groundwater table and hygromorphous soils. Natural vegetation: alluvial forests and swamps, and at higher elevations oak forests and grassland on sand as well as loess puszta.

3. West Hungarian Borderland
Valleys, foothills, medium-height mountains with broad ridges, 150-883 m. Eroded hills in the subalpine regions on brown loess and pseudogleyeus soils with mosaics of forests mixed with Scotch pine *(Pinus silvestris)* partly used for agriculture, as well as eroded hills (250-350 m) with lessivated brown forest soil on brown loess; partly used for agriculture. Natural vegetation: mainly illyrian oak-hornbeam forests as well as illyrian beech forests and oak forests mixed with Scotch pine.





Map 1, 3. Natural landscape regions of Hungary: (1) Great Hungarian Plain (Flat plains, 75-200 m), (2) Little Plain (Ibidem), (3) West Hungarian Borderland (Hills, foothills, medium-height mountains with broad ridges, 150-883 m), (4) Transdanubian hills (Valleys, hills, foothills, medium-height mountains, 150-682 m), (5) Transdanubian Mountains (Medium-height mountains 200-756 m), (6) North Hungarian Mountains (Medium-height mountains, 300-1014 m).

Map 2. Natural vegetation in Hungary.
- Oak forests mixed with Scotch pine and noncalcareous Scotch pine forests.
- Montane (= MN), submontane (= TM) and illyrian (= TH) beech forests.
- Sessile oak-Turkey oak forest and other oakwoods on acid soils.
- Oak forests and grasslands on sand.
- Alluvial forests and swamps.
- Continental hairy oak forests, shrub forests, steppe meadows on slopes, rock swards.
- Alkali vegetation on solonetz; formerly partly flood-plain vegetation.
- Transitional and Sphagnum bogs +.
- Agricultural area.

4. Transdanubian Hills

Valleys, hills, foothills, medium-height mountains, 160-682 m. Mainly in the west fixed sandy plain with minor dunes, cultivated grassland on brown earth, local afforestation and orchards. In the east at first independent hilly regions dissected by eroded valleys, mostly cultivated grassland with deep groundwater table, vineyards and major remnants of mixed forests. In the south forested landscape types in mountains of medium height (Mecsek Mts., Villányi Mts.). Low of calcareous rock or sandstone wit hredzina and lessivated brown forest soils, typically with Tilio argenteae-Quercetum or illyrian oakhornbeam forests (Helleboro Carpinetum), and mosaic illyrian karst with hairy oak, karst shrub-forest and rock swards.

5. Transdanubian Mountains

Medium-height mountains, 200-756 m. Mainly low mountains under additional subatlantic and submediterranian climatic influence. Quercetum petraeae cerris and Quercetum petraeae Carpinetum forests. In part hills dissected by eroded valleys; cultivated grassland with mosaic of vineyards and orchards and Quercetum petraeae cerris forests and deep groundwater table. On the mountain slopes are many kinds of karst shrubforest and rock swards, e.g. in the Bakony Mts, in the Vértes Mts an in the Budai Mts.

6. North Hungarian Mountains

Medium-height mountains, 300-1015 m. Extremely variable landscape type. In one respect a characteristic is the crests of volcanis mountains with black "nyirok" (regiolith) and podsolic

brown forest soil, submontane beech forests (silviculture with touristic and recreational use Mátra Mts, Zempléni Mts). On the other hand the low mountains are predominantly of calcareous rocks with redzina and brwon earth (Bükk Mts, Aggteleki Mts). The Bükk Mts and Aggteleki Mts are at present a National Park. Natural vegetation. mainly Quercetum petraeae cerris, submontane oak hornbeam forests, submontane and monate beech forests, e.g. in the Mátra Mts. (1015 m), in the Bükk Mts (958 m) and in the Zempléni Mts (783 m).

Conservation of Zygaenidae in Hungary

According to the Hungarian nature protection law (1993), the following species are protected; *Zygaena laeta, Zygaena fausta agilis; Jordanita graeca, Adscita geryon.* Earlier eight species were considered to be endangered by FAZEKAS in the Hungarian Red Book (RAKONCZAY, Z. 1989). The list of the endangered species in need of protection is much broader, however. I have prepared the detailed UTM map of the ten species which are under threat of extinction or are especially endangered. (Figs. 1-12).

Table 1. Distribution and conservation status of Hungarian Zygaenidae according to the natural landscape regions of Hungary.

No.	Taxon	Great Hungarian Plain	Little Plain	West Hungarian Borderland	Transdanubian Hills	Transdanubian Mountains	North Hungarian Mountains	Conservations status
1.	*Z. punctum*	5	–	–	8	8	4,8	V
2.	*Z. cynarae*	4,7	–	–	10	8	8	E
3.	*Z. laeta*	5,7	–	10	9	5,7	10	E
4.	*Z. brizae*	8	–	7,8	5	5,7	3,4	V
5.	*Z. minos*	6	–	8	5	5	4,5	R
6.	*Z. purpuralis*	6	6	6	2	2	2	N
7.	*Z. fausta agilis*	–	–	10	–	9	–	E
8.	*Z. carniolica flaveola*	3	6	3	2	2	2	N
9.	*Z. loti*	3	6	3	2	2	1	N
10.	*Z. osterodensis curvata*	–	–	6	–	5	4,5	V
11.	*Z. viciae*	8	8	3	3	3	2	N
12.	*Z. ephialtes pannonica*	4,5	6	5	3	3	4,6	I
13.	*Z. angelicae*	–	–	–	5	5	4,6	I
14.	*Z. filipendulae polygalae*	3,4	6	6	2	2	2	N
15.	*Z. lonicerae*	5	–	6	1	2	2	N
16.	*T. ampellophaga*	–	–	6	6	6	6	N
17.	*R. pruni*	4,8	–	8	5	5	4,5	I
18.	*J. budensis*	7,8	–	–	10	7	4,8	E
19.	*J. notata*	–	–	10	9	9	10	E
20.	*J. subsolana*	9	–	–	9	8	4,8	V
21.	*J. graeca*	9	–	–	–	7	9	E
22.	*J. chloros*	5	–	–	5	7	4,5	V
23.	*J. globulariae*	6	6	3	2	2	2	N
24.	*A. geryon*	8	–	–	8	5	8	V
25.	*A. statices*	5	6	3	2	2	4,2	N

The categories of each taxon are given in a distribution table. The categories used those recommended by IUCN:

Definitions of the distribution and conservation status categories and abbreviations used in table 1.

(1) Distributed everywhere and mostly frequent euryoecious species.

(2) Distributed everywhere and on average frequent species in the majority of cases.

(3) Locally distributed species which can occur in greater numbers in euitable places.

(4) Species known only in nature reserves.

(5) Known only in local populations; their survival is presumed to be possible.

(6) Determination of distribution frequency is uncertain due to incomplete research.

(7) Most of the records before 1960 have not been confirmed. The species can be in regression.

(8) Known only in some isolated population, gene flow is uncertain, their survival is presumed to be possible.

(9) Known only in a small number of populations restricted to severel places. Usually stenoecious species. Their survival is uncertain.

(10) Populations have disappeared or presumably be come extinct since 1960.

(–) There are no confirmed data on this territory.

Conservation status (IUSN)

(E) Endangered: Taxa in danger of extinction- Survival is unlikely if the factors contributing to the decline continue. Taxa which formely had numerous isolated populations in Hungary, of which only a single or on to a few populations remain today.

(V) Vulnerable: Taxa believed likely to move into the endangered category in the near future if the factors contributing to the decline continue. Taxa which are locally abundant, but whose populations have declined and are now isolated or restricted to particular areas.

(R) Rare: These taxa are usually localized within restricted geographical areas or habitats, or are thinly scattered over a more extensive range.

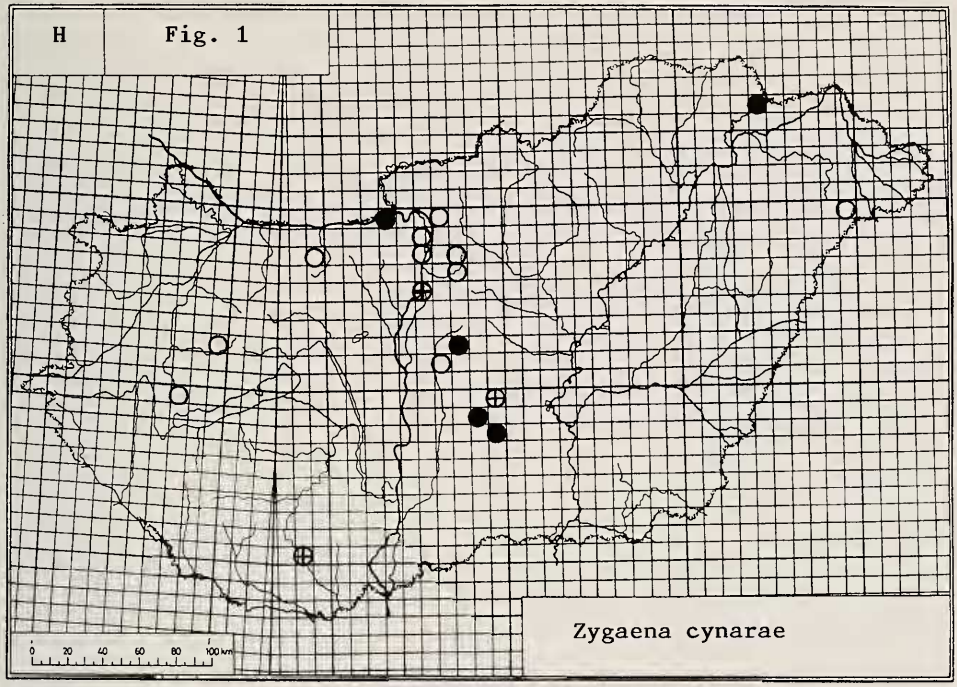
(I) Indeterminate: The status of some taxa was most difficult to ascertain. Taxa probably available. In some cases, the decision as to whether or not to unclude a taxon had to be based on professional judgement.

Remarks

Records of several Hungarian species are based on misidentification or erroneous or unreliable locality data. Only one early specimen of *Zygaena trifolii* (ESPER, 1783) is known (Transdanubian Hills; Kaposvár). Recent research has not confirmed its presence and presumably the specimen is wrongly labelled.

Specimens of *Zygaena contaminei* BOISDUVAL, 1834, from the Bükk National Park (North-Hungarian Mts) and *Zygaena diaphana* STAUDINGER, 1887, have been misidentified (ÁCS & SZABÓKY 1993), and belong to other species. *Zygaena contaminei* is endemic to the Iberian

Figs. 1-12: Localities of *Zygaena*, *Jordanita* and *Adscita* species in Hungaria. ▷
○: known populations before 1960; ●: recent breeding populations; ⊕: disappearance or possible extinction.


H
Fig. 1
Zygaena cynarae
0 20 40 60 80 100 km

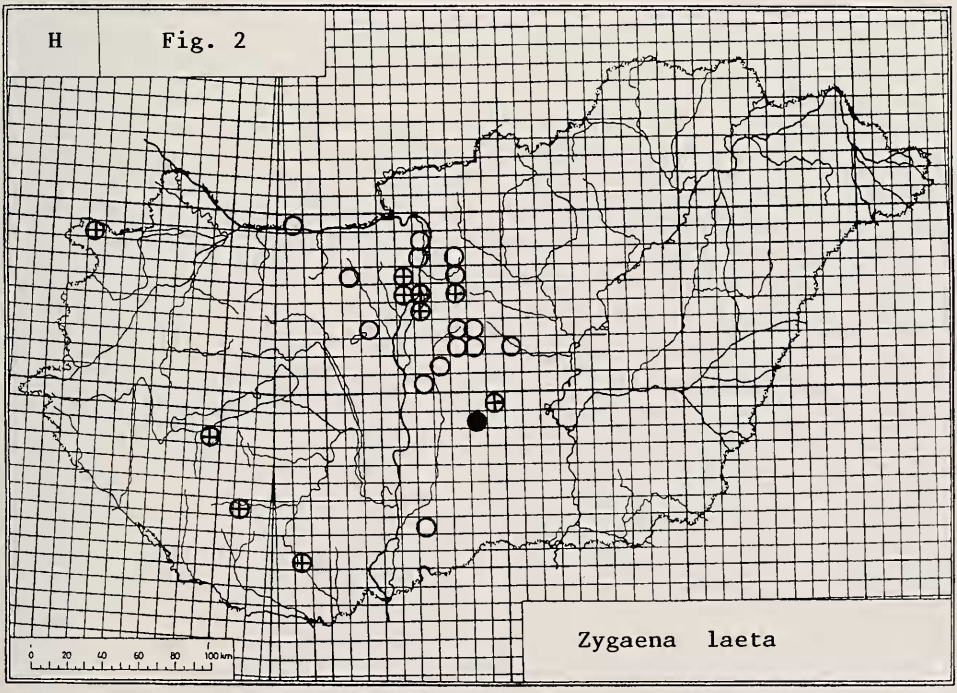

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Fig. 2
Zygaena laeta
0 20 40 60 80 100 km

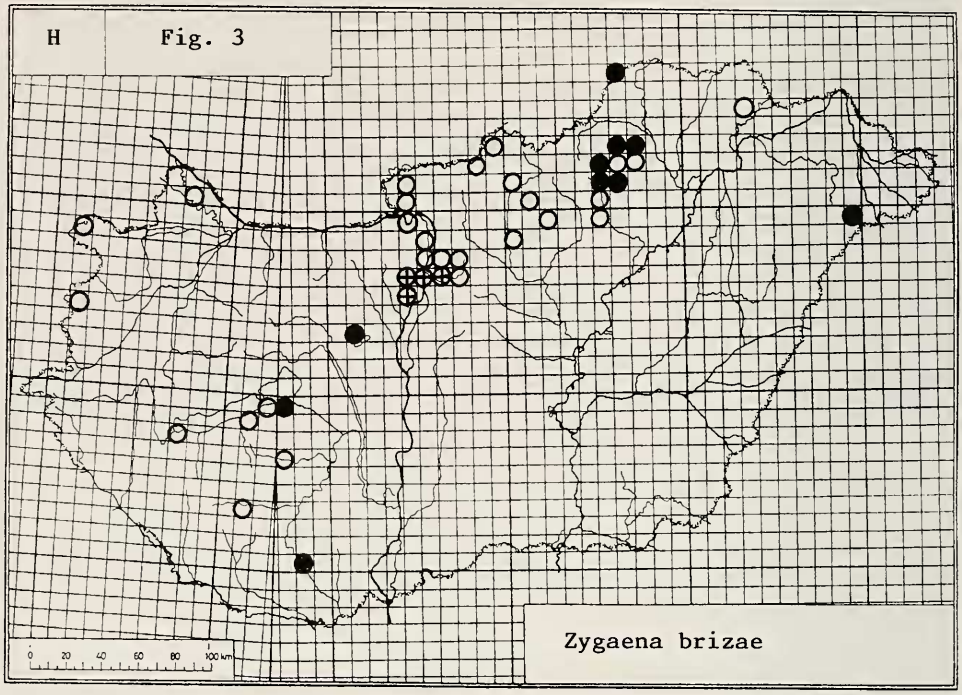
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Fig. 3
0 20 40 60 80 100 km
Zygaena brizae

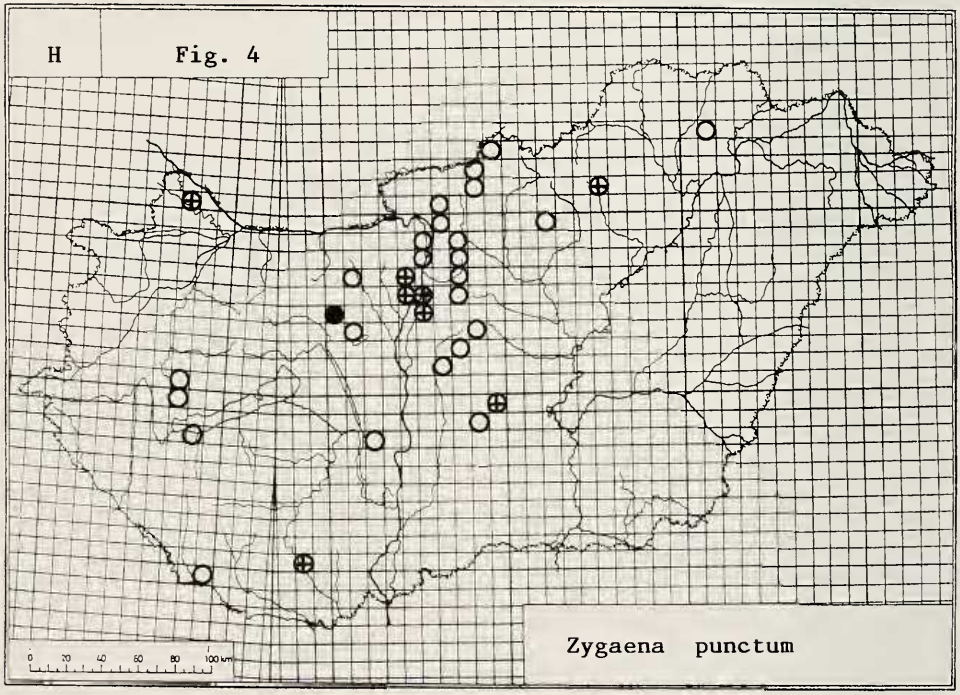
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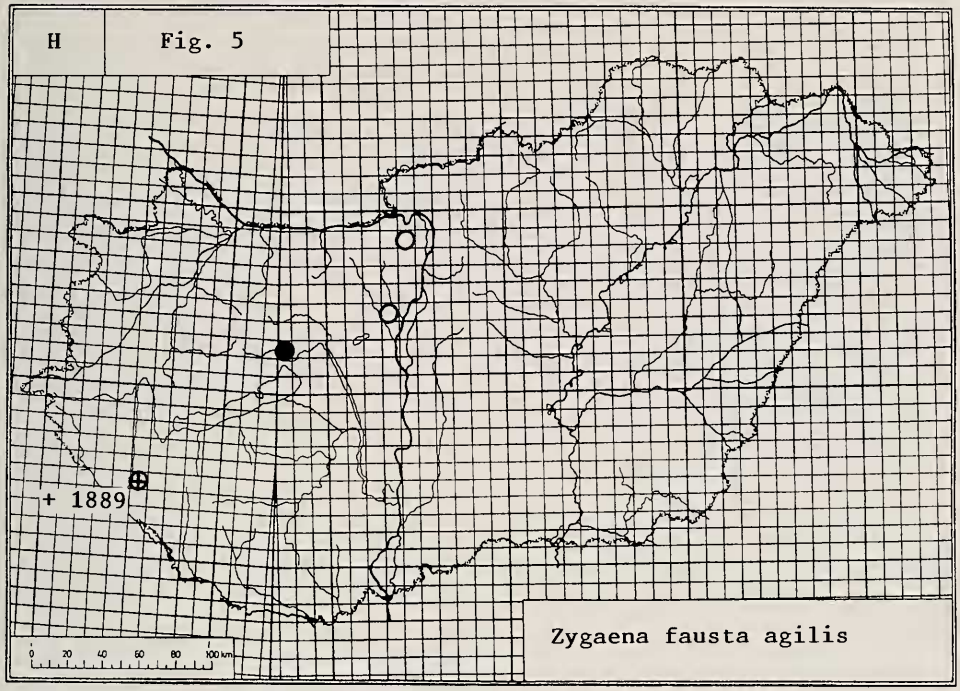
Fig. 4
0 20 40 60 80 100 km
Zygaena punctum


H
Fig. 5
+ 1889
0 20 40 60 80 100 km
Zygaena fausta agilis

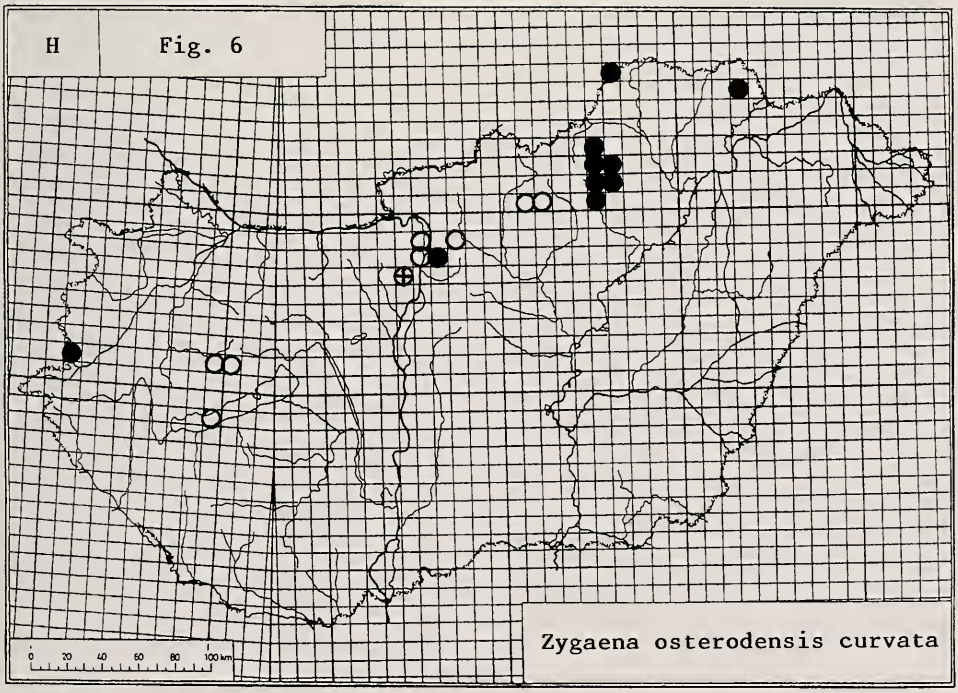

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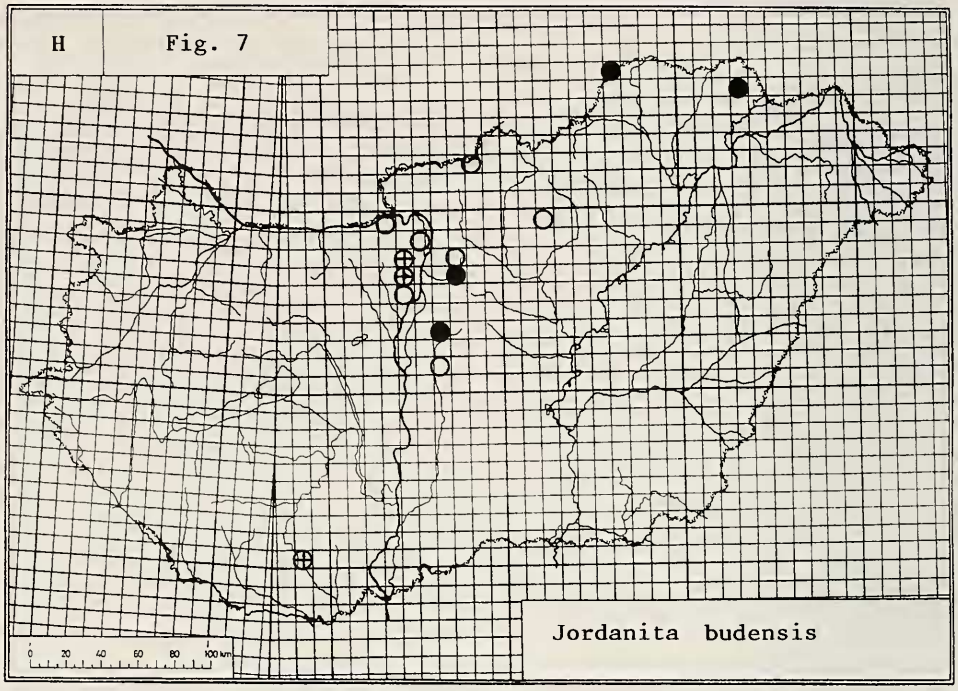
Fig. 6
0 20 40 60 80 100 km
Zygaena osterodensis curvata


H
Fig. 7
0 20 40 60 80 100 km
Jordanita budensis

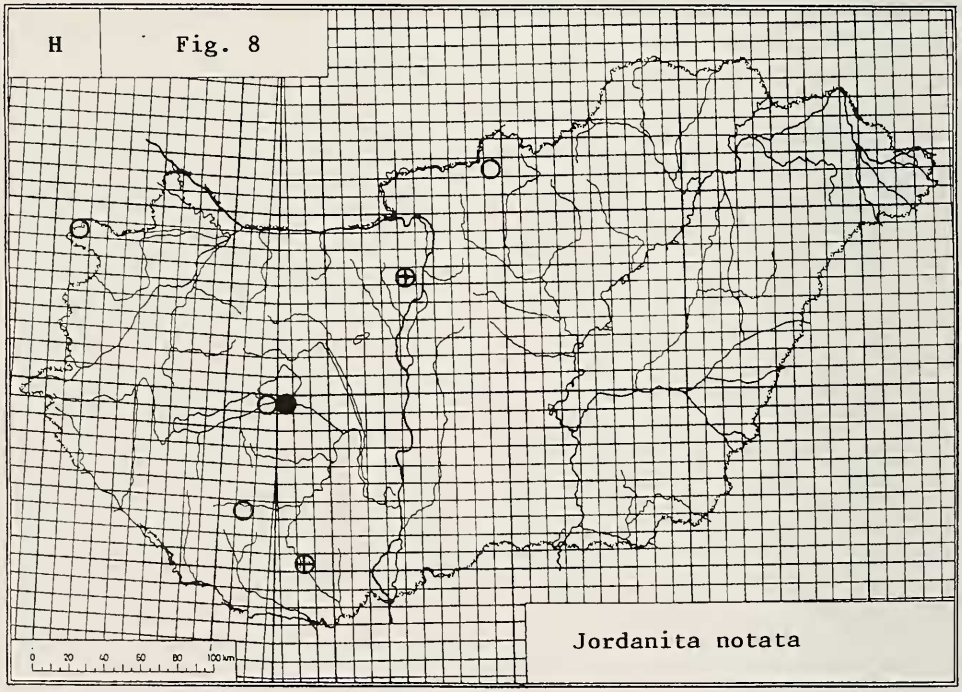

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Fig. 8
0 20 40 60 80 100 km
Jordanita notata

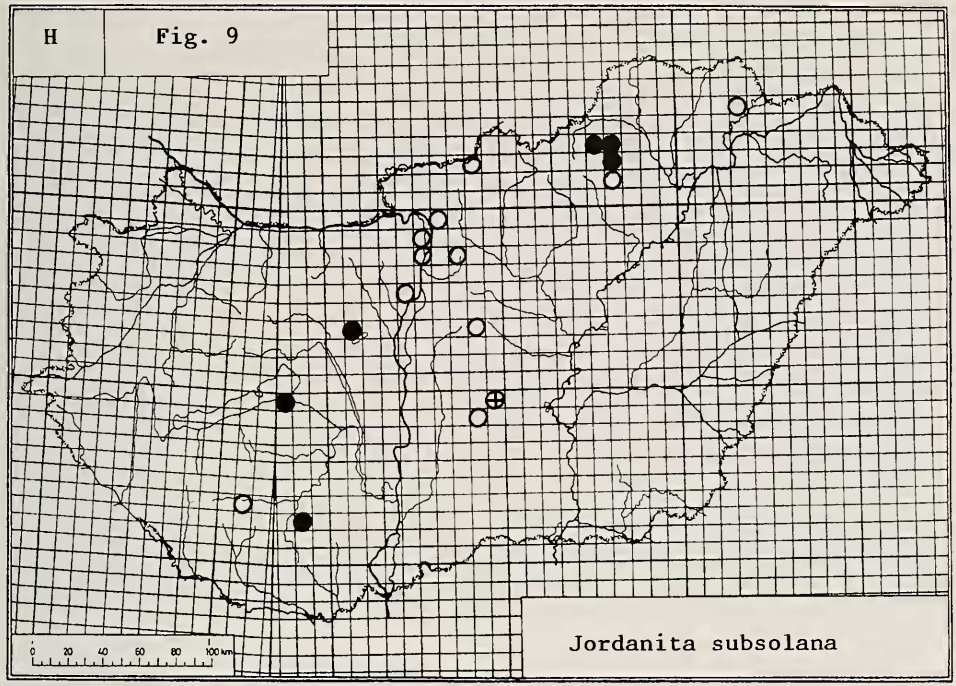
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Fig. 9
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Jordanita subsolana

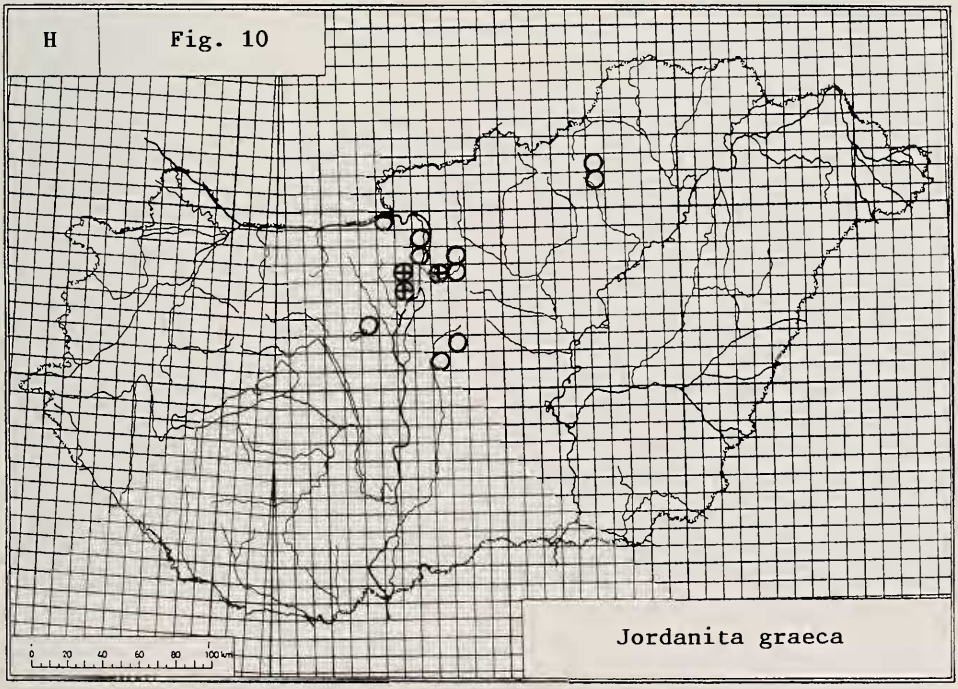
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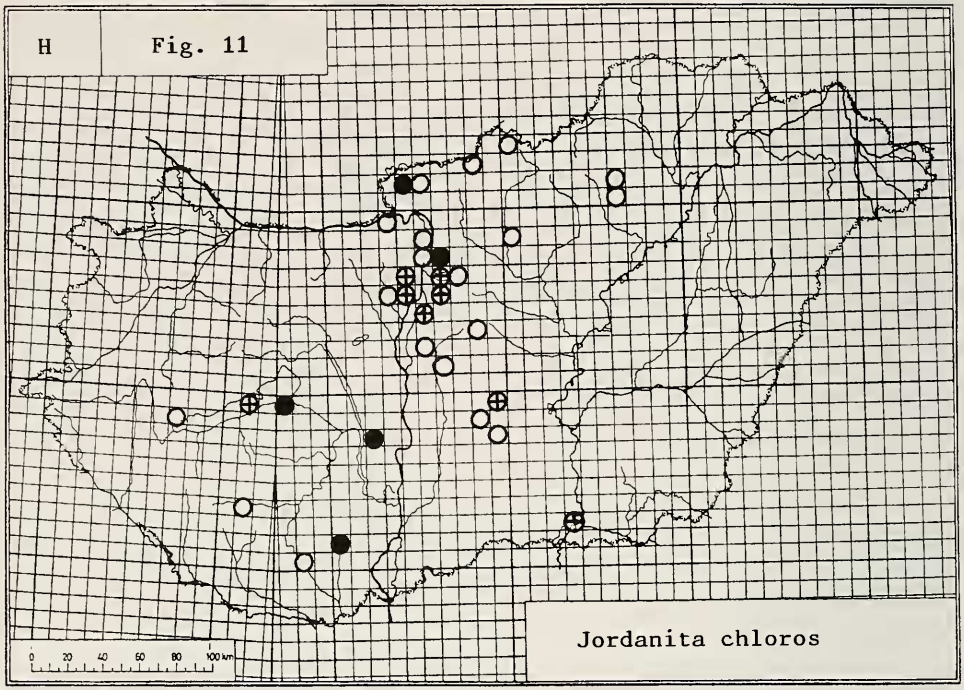
Fig. 10
0 20 40 60 80 100 km
Jordanita graeca


H
Fig. 11
0 20 40 60 80 100 km
Jordanita chloros

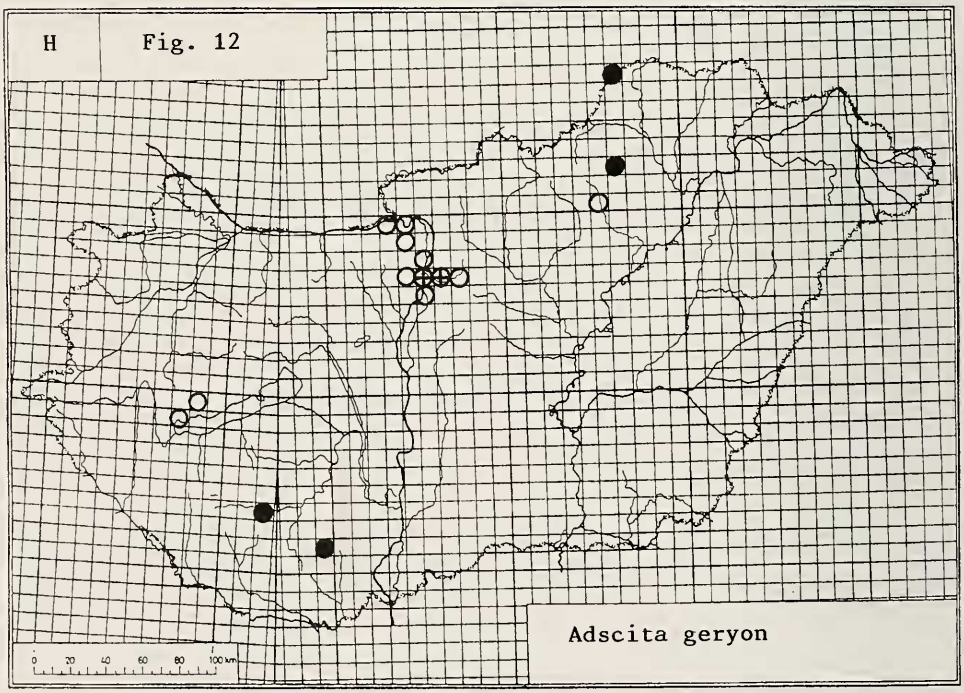

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Fig. 12
0 20 40 60 80 100 km
Adscita geryon

Fig. 13: Alkaline vegetation on solonchalk (Puccinellietalia). Great Hungarian Plain at Csongrad. A habitate of *Zygaena laeta* HBN. (extinct), *Zygaena carniola flaveola* ESP. (Foto: TÓTH, S.)

Fig. 14: Limestone hills (Jurassic period) with meadows (Festucetum pratensis) and with illyrian oak-horn-bean forests (Asperulo taurinae-Carpinetum) and illyrian beech forests (Helleboro odoro-Fagetum) at "Baranyai Hegyhát" (Transdanubian Hills). A habitate of *Zygaena viciae* D. & S., *Zygaena filipendulae polygalae* ESP., *Jordanita subsolana* STGR., *Adscita geryon* HBN. and *Adscita statices* L.

Fig. 15: Limestone medium mountains (Jurassic and Triassic period) with meadows (Calamagrostietum epigeii) and typically with Querco-Fagetta p.p. in South-Hungary (Mecsek Mts, 682 m). A habitate, rich in butterflies and moths, partly changed by antropogenic factors. Species flying here include *Jordanita chloros* HBN. and *Jordanita budensis* SPEYER & SPEYER (? extinct).

peninsula and does not occur in other parts of Europe.

The record of Hungarian *Adscita mannii* (LEDERER, 1853) is also based on a misidentification. European authors have ignored the Hungarian populations of *Zygaena fausta agilis* REISS, 1932 until now. Breeding populations were discovered in four places in 1965 and 1979, althoush we have nor recent data. The identification and collectors of the species is authentic, and voucher specimens are preserved in the Hungarian Museum of Natural Science (FAZEKAS 1989; 1995).

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Address of the author:

Imre FAZEKAS
Natural History Collection at Komló
Városház tér 1
H-7300 Komló
Hungary